

IN THE CLAIMS:

Please CANCEL claims 1-12, 14-15, 18-19 and 21-22, without prejudice or disclaimer.

Please AMEND the claims as follows:

1-12. (CANCELED)

13. (CURRENTLY AMENDED) ~~The~~An optical waveguide according to claim 1,
~~further~~that is formed on a substrate, the optical waveguide comprising:
a curved ridge structure that is formed by etching the substrate so as to have a curvature
in a longitudinal direction of the curved ridge structure;
a curved optical path that is formed along the curved ridge structure;
a buffer layer that covers a side of the curved ridge structure and that has a lower
refractive index than a refractive index of the substrate;
a straight optical path that is coupled with the curved optical path;
a second ridge structure that is formed on the substrate along the straight optical path;
and
a second buffer layer that covers a side of the second ridge structure and that has a lower refractive index than a refractive index of the substrate, wherein
the straight optical path is formed in and along the second ridge structure, and
the second ridge structure has a width increased along the straight optical path.

14. (CANCELED)

15. (CANCELED)

16. (CURRENTLY AMENDED) ~~The~~An optical waveguide according to claim 1,
~~further~~that is formed on a substrate, the optical waveguide comprising:
a curved ridge structure that is formed by etching the substrate so as to have a curvature
in a longitudinal direction of the curved ridge structure;
a curved optical path that is formed along the curved ridge structure;
a buffer layer that covers a side of the curved ridge structure and that has a lower
refractive index than a refractive index of the substrate; and
an optical path that is coupled with the curved optical path and that has a width different
from a width of the curved optical path, wherein
the optical path is coupled with the curved optical path so that an axis of the

optical path is shifted from an axis of the curved optical path.

17. (CURRENTLY AMENDED) ~~The~~An optical waveguide according to claim 1, further~~that~~ is formed on a substrate, the optical waveguide comprising:
- a curved ridge structure that is formed by etching the substrate so as to have a curvature in a longitudinal direction of the curved ridge structure;
- a curved optical path that is formed along the curved ridge structure;
- a buffer layer that covers a side of the curved ridge structure and that has a lower refractive index than a refractive index of the substrate;
- a straight optical path that is coupled with the curved optical path;
- a second ridge structure that is formed on the substrate along the straight optical path;
- and
- a second buffer layer that covers a side of the second ridge structure and that has a lower refractive index than a refractive index of the substrate, wherein
- the straight optical path is formed in and along the second ridge structure, and
- the second ridge structure is connected to the curved ridge structure so that an axis of the second ridge structure is shifted from an axis of the curved ridge structure.

18. (CANCELED)
19. (CANCELED)

20. (CURRENTLY AMENDED) ~~The~~An optical device according to claim 18, wherein the ~~for performing phase modulation, comprising:~~
- optical waveguide ~~further~~that includes
- a curved ridge structure that is formed by etching a substrate so as to have a curvature in a longitudinal direction of the curved ridge structure;
- a curved optical path that is formed in and along the curved ridge structure;
- a buffer layer that covers a side of the curved ridge structure and that has a lower refractive index than a refractive index of the substrate;
- a second ridge structure that is formed on the substrate straight in a longitudinal direction of the second ridge structure;
- a straight optical path that is coupled with the curved optical path and that is formed in and along the second ridge structure; and
- a second buffer layer that covers a side of the second ridge structure and that

has a lower refractive index than a refractive index of the substrate; and
a signal electrode that is disposed on and along the optical waveguide, wherein
optical signals transmitted through the curved optical path and the straight optical path interact with electric signals transmitted through the signal electrode, and
the curved ridge structure and the second ridge structure have a constant width.

21. (CANCELED)

22. (CANCELED)

23. (ORIGINAL) A method of manufacturing an optical waveguide, comprising:
forming a pattern of titanium on a substrate, the pattern including a curved pattern for forming a curved optical path;
thermally diffusing the pattern at a high temperature;
forming a ridge structure by etching the substrate positioned at a side of the curved pattern, along a shape of the curved pattern; and
forming a buffer layer on a side of the ridge structure, the buffer layer being made of a material that has a lower refractive index than a refractive index of the substrate.

24. (ORIGINAL) A method of manufacturing an optical waveguide, comprising:
forming a proton exchange pattern on a substrate by proton exchange, the pattern including a curved pattern for forming a curved optical path;
forming a ridge structure by etching the substrate positioned at a side of the curved pattern, along a shape of the curved pattern; and
forming a buffer layer on a side of the ridge structure, the buffer layer being made of a material that has a lower refractive index than a refractive index of the substrate.